

What is claimed is

1. A resonator apparatus comprising

a piezoelectric resonator; and

an acoustic reflector comprising a sequence of stacked layers having alternating low and high acoustic impedance;

wherein the thickness of one layer is set different from a quarter of the acoustic wavelength in this layer at the operating frequency due to technological limitations in the manufacturing of this layer, and

wherein the thickness of the other layer is set dependent from the one layer, such that a predetermined minimum quality of the acoustic reflector is attained,

wherein the thickness of the one layer is decreased relative to the quarter of the wavelength, and wherein the thickness of the other layer is increased relative to the quarter of the wavelength.

2. The resonator apparatus according to claim 1, wherein the one layer is the layer having a high acoustic impedance and wherein the other layer is the layer having a low acoustic impedance.

3. The resonator apparatus according to claim 1, wherein the one layer is the layer having a low acoustic impedance, and wherein the other layer is the layer having a high acoustic impedance.

4. The resonator apparatus according to claim 1, wherein the acoustic reflector is a plurality of layers having a high acoustic impedance and comprises a plurality of layers having a low acoustic impedance.

5. The resonator apparatus according to claim 1, wherein the layer having a high acoustic impedance is made of tungsten, platinum, molybdenum or gold, and wherein the layer having a low acoustic impedance is made of silicon dioxide or aluminum.

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6. The resonator apparatus according to claim 5, wherein the thickness of the layer having a high acoustic impedance is of approximately one eighth of the wavelength in this layer at the operating frequency, and wherein the thickness of the layer having a low acoustic impedance is increased by approximately 10 % relative to the quarter of the wavelength.

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7. The resonator device according to claim 1 comprising a substrate, wherein the acoustic reflector is arranged between the substrate and the piezoelectric resonator.

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8. The resonator apparatus according to claim 7, wherein the piezoelectric resonator is made of ZnO or AlN, and wherein the substrate is made of silicon.

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9. The resonator apparatus according to claim 1, wherein the piezoelectric resonator is a BAW resonator.